CBNG Task Force
July, 6 2006
Buffalo, Wyoming
Bozeman Trail Steakhouse & Conference Center
Minutes taken by Travis Jordan

The meeting was called to order by Chairman Pat Childers

Chairman Childers made several opening remarks to the taskforce and the general public regarding the operation of the taskforce.

John Corra spoke on behalf of the consensus making process, provided examples of the consensus building process and provided some guidelines for the operation of the taskforce.

Consensus was reached over the process outlined in the consensus building process

Chairman Childers then called to discuss the mission statement of the taskforce in addition to stimulating conversation regarding the schedule of the taskforce.

Pat Tyrell suggested that the taskforce spent the next following meetings spending time to better understand the issues in front of the taskforce and suggested that the group consider discussing recommendations for the legislature in the fall.

Rep. Brown then reminded the group about the time constraints of the taskforce's work with the schedule of the legislature's general session in 2007 and the budget session in 2008. Discussion then ensued on the timing of the taskforces work to line up with the general session to ensure greater support than during a budget session. Emphasis on reviewing polices first to meet the filing deadline in the spring was given. Joseph Olson and Helen Jones then expressed concern for moving too fast on statue changes considering the weight of the issue.

Thomas Clayton initiated conversation regarding the mission statement of the taskforce and asked that scoping and recommend solutions be included in the first sentence of the mission.
Pat Tyrell and John Pope provided additional suggestions to the mission statement.

[add] now or in the future, [add] define water management practices that may exist, and recommend solutions,

Aaron, Corra and Tyrell will draft the changes at reflected from the comments of the taskforce, circulate those changes and have the taskforce approve the changes at the August meeting.

A Primer on CBNG Produced Water Chemistry and Potential Effects on Soils
Presentation by: Kevin Harvey; KC Harvey Inc. Certified Soil Scientist; Bozeman, Montana

Issues:
Water Quality for Designated Uses, Evolution of CBM Water, Salinity v. Sodicity, Effects of salinity and sodicity on soils infiltration, Summary of salinity impacts on soil and sodicity impacts on soil. See Powerpoint.

Agricultural Use Protection Policy
Presentation by: Bill DiRienzo; State of Wyoming; Department of Environmental Quality-Water Division
Issues: Water quality rules and regulations, purpose, policies for livestock watering and irrigation, 3-teired process for irrigation approval, access to enforce policy for each tier, and future issues of concern. See Powerpoint.

Summary of Agriculture Benefits and Conflicts from CBM produced Water Discharge
Presentation by: Grant Stumbough; State of Wyoming; Agriculture Department Natural Resources Policy Manager
Issues: Benefits to agriculture from CBM water, number of permitted stock water/reservoir use permits; increased crop irrigation, riparian area enhancement, aquaculture, dust abatement, conflicts and concerns w/ CBM water, and Dept. of Ag management tools. See Powerpoint

Campbell County Experience with CBM Produced Water
Presentation by: Robert Brug; Campbell County Conservation District/Rancher and Michelle Cook, Manager Campbell County Conservation District
Issues: Recent projects and sampling, baseline data, workshops and educational opportunities for landowners, experience with the CRM process, and agricultural producers experience with CBM water.

Lake De Smet Conservation District Experience with CBM Produced Water
Presentation by: Bill Wells: Lake De Smet Conservation District; Volunteer, former supervisor and local rancher
Issues: Previous practices manual, application of previous studies to current practices, knowledge of water quality for livestock, negatives for landowners-lack of knowledge of better management practices and water use, lack of trust with laboratories/University, need to treat/injection, conservation efforts to assist reclamation, spread of salt cedar as a result of salinity of CBM water.

Public Comment Period:
Sen. Stan Cooper; Representing the Upper Green River Water Board- Interested in the use of water and how that water is managed. Encouraged the taskforce to remember that Wyoming is a member of the Colorado River Compact. and that the water could be used in time of drought.
Nearly inevitable that CBM development will soon come to the Green River basin. The water board would like to be on the forefront of the development of the water resources including the treatment of the water released from producers. Is looking forward to the recommendation released by the taskforce.

Kevin Linn; Powder River Resource Council- Presenting information regarding CBM water discharge from academia and the group is primary interested in the quantity of water being produced. Read from a report by Dr. Larry Mundt of the University of Wyoming regarding the discharge of water on the soils of the Powder River Basin. Read an additional study done by Dr. Mundt regarding the application of quality water for irrigation uses. Read an additional study from Dr. Jim Bower of the University of Montana that states the problems with soils solidifying after the end of water discharge periods.

Tim Barber; Yates Petroleum- Wished to clarify the information that was presented by him at a previous meeting of the taskforce regarding the 100 year flood event occurrences. Elaborated on the containment of CBM water and expressed concern for the current policy of protecting a watershed with 50 year limits to get an agricultural use prevention policy.

The taskforce was recessed at 12:08 PM for lunch by Chairman Childers

Chairman Childers reconvened the meeting at 1:18 PM.

Surface Irrigation using CBM Produced Water
Presentation by: Kevin Harvey; KC Harvey Inc. Certified Soil Scientist; Bozeman, Montana
Issues:Managed irrigation principles, need for management with CBM management for irrigation use, procedures for CBM water conditioning, Project Water Balance, monitoring of EC, SAR, and leaching of discharge areas. Examples: Fidelity Exploration-Tongue River Project Area, Williams Production-Powder River Project Area. Statistics of management: approximately 3500 acres of private land of managed irrigation in the basin, 68 million barrels of water are applied a season, .2 inches of water applied a day, forage yields were 2.5-3 tons per acre. See Powerpoint.

Subsurface Drip Irrigation using CBM Produced Water
Presentation by: John Zupancic; Chief Technical Officer; BeneTerra LLC.
Issues:Developing technologies for waste water irrigation systems (variable water production and varying field shapes), subsurface irrigation practices using produced CBM water, results from test sites in Sheridan, economics of subsurface irrigation methods. See Powerpoint

Results from Irrigation Field Tests using CBM Water and Soil Amendment
Presented by: Jeff Morris; Western Research Institute
Issues: Background of the organization, examples of land application in Buffalo, results using Gypsum Amendments to water, methods of application for Gypsum Amendments, benefits of using a combined water and soil treatment measure. Tools of monitoring: GIS, Remote Sensing. See Powerpoint.

Chairman Childers recessed for a break at 2:30 PM
Chairman Childers reconvened the session at 2:39 PM

Higgins Loop Continuous Ion Exchange
Presented by: Doug Beagle; EMIT Water Discharge Technology, LLC

Issues: EMIT's Administrative Role, Higgins Loop Water Treatment Process, Permit Based Processes Sodium and SAR, Cylindrical Resin Loop, EMIT Water Quality Data, Advantages of the EMIT Treatment Process, Costs of Treatment, issues related to the discharge of treated water. See Powerpoint

Wyoming State Geological Survey Desalination Report
Presented by: Keith Clarey; Wyoming State Geological Survey
Issues: Background and history of the desalination study, current methods of desalination, desalination costs and capabilities, benefits and applications of desalinized water, potential locations for desalination plants and pipelines. Scenarios for desalinization efforts, reverse osmosis water treatment, summary of desalination alternatives. See Powerpoint.

Produced Water Treatment and Transportation
Presented by Jeff Cline; Anadarko Petroleum; Representing PAW
Issues: Contradicted the WGS Desalination report. They provided additional costs that had not been reflected in the WGS report. See Handout.

Pipeline Report
Presented by Mike Besson; Water Development Commission
Mike provided a handout which outlined the issues and information that is needed to complete the feasibility study.

Follow-up from last meeting

Water Quality/Quantity
Presented by Mike Barrish; AG's Office
Mike provided background information on the legal aspects of water quantity as it related to water quality.

Dam Seepage
Presented by Pat Tyrell; SEO
Background on SEO inspection activities. See Powerpoint.

Dr. Cook's e-mails
Director Corra provided background on the hydrological situation related to Dr. Cook's situation and concerns.

PUBLIC COMMENT
Carl Dewey; Rancher; Northern Sheridan County
Presented pictures of CBM developed stock facilities at his ranch. Mr. Dewey grows alfalfa and wheat grass on land irrigated by CBM water where the soils are treated. The pictures presented indicated that the alfalfa was healthy and yields were relatively high. Mr. Dewey attested to the higher yields in alfalfa

and livestock production. Pictures also indicated that wildlife; including mule deer and wild turkeys were present in the fields irrigated by CBM water. Mr. Dewey testified that CBM water has saved him the need of developing water well for his personal use which are often costly, unreliable and had relatively low output.

Betty Rice; Rancher; Southern Campbell County; 22 miles South of Gillette.
Mrs. Rice is a 4th generation rancher who uses CBM produced water for livestock, for the lawn, garden and for raising trout where stored in reservoirs. According to the testimony, calves are 40 lbs. heavier since CBM water has been used to irrigate and water is useful for domestic applications on the ranch. The water being used is untreated and out of the Big George formation. Mrs. Rice believes that landowners should have the opportunity to decide how water is managed on their property. Mrs. Rice also claims that cooperation begins with working closely and early with methane companies.

Jerry Geer; Rancher; Southern Campbell County
CBM water has been discharged on Mr. Geer's ranch since the first wells were drilled in 200 on the Wyodak coal seam. Water is discharged on every single pasture for cattle in addition to being used for domestic purposes with the assistance of the operator. Mr. Geer believes that the management of water resources should be left to the landowner and that in most cases landowners want the water to ease the impact of the drought. With his experience, industry works well with landowners in most instances. Although the water discharge has dropped over the years, Mr. Geer believes that the landowner/CBM industry relationship is a win/win situation.

Joanne Tweedy; Rancher; Campbell County
Distributed pictures for review by the taskforce. Mrs. Tweedy believes that the taskforce should embrace a recommendation that gives ranchers numerous options to manage water development. Mrs. Tweedy would also like to see government stay out of the operation of her business.

Gene and Pat Litton; Rancher; Southern Campbell County
Ranch celebrating 50 years, water is a great asset. Used primarily for livestock and helps with the wildlife. Now has elk, 75% of livestock water comes from CBM. Water is of high quality and at the same level of residential water. Irrigate over 1200 trees, yard and garden. Water is piped all over the ranch, without water they would not have been able to run livestock. Would not want to see any rules made that would hinder their ability to manage water resources. Mr. Litton is seeing no depletion of his domestic well and has observed a new spring on his property.

Richard Zander; Zander Environmental LLC
Experience with CBM has been through business interactions and the Bureau of Reclamation. He believes that the measures used before to mitigate the impacts of CBM development are no longer applicable. Mr. Zander cited a study the USGS has started regarding improving CBM production by rewatering coal seams. Lab studies show that reintroducing water in the presence of microbes in coal seams may have the potential of regenerating natural gas. He believes that the current CBM discharge

practices are wasting a precious water resource and that water should be reinjected into the Eastern portion of the basin.

Marge West; Rancher; Northern Campbell County; Spotted Horse Area
CBM has caused several major issues on her property. Without surface use permits, the energy operator released water down the draw during the winter months. Mrs. West explains that approximately 80 acres of alfalfa and natural grasses were destroyed because of freezing and flooding. Additionally, nearly 200 cottonwoods lost due to the water released. Mrs. West received a surface use agreement after the winter flooding incident, however, the operator refused to compensate for the loss of the hay meadows and surrounding vegetation. Mrs. West expressed additional frustration with the energy operators neighboring her property. Foxtail grasses are becoming more abundant in areas where discharge from upstream producers flows through her property. During summer storms, existing reservoirs overflow because of the additional presence of CBM water and she and her husband are often required to finish repairs started by the operator.

Major Robert Harsharger; Rancher/Retired Air Force; Cheyenne River Area
Mr. Harsharger expressed that the effects of CBM discharge are not all positive. The Cheyenne River flows through is ranch for six miles, and the water from the river has been used to irrigate for over 100 years. Mr. Harsharger is concerned about both the upstream and downstream effects of CBM releases because the ranch has used water from the river to irrigate for over 100 years. Production of alfalfa has diminished and Mr. Harsharger attributes the change to the water chemistry. Discharge permittee upstream reduced output per day on 2 permits and EC has dropped from 2000 to 1300. However, even with an EC of 1,300 the rancher estimated that during a single year of irrigation 200,400 lbs of salt would be distributed over his 50 acre alfalfa pasture which equates to exactly a pallet of salt being distributed on his pasture per year. Mr. Harsharger expressed additional concern for local riparian areas and plans to submit a written comment to the taskforce.

Monica Yetter; Technical Journalist/Consultant; Coalbed Natural Gas Alliance
Monica expressed support for CBM industry and discharge. Through her conversations, land owners are glad to use CBM water. Land owners enjoy the wide range of opportunities they have for the management of their property. From her experience, she believes that landowners are happy to have access to discharge water. Monica believes that a single policy tool would not be the answer for the taskforce, but instead evaluation should be a site specific evaluation.

Laurie Goodman; Wyoming Landowners Association
Lorry explains that landowners are generally on both side of the CBM discharge issue. She believes that after 6 years of practice by the industry, it is clear that a regulatory solution will not work. , regulatory will not work. Lorry also believes that the issue in this conflict is private property rights and that the government should stay out of water development on private property.

Ed Swartz; Rancher; Northern Campbell County; Wildcat Creek Area
Mr. Swartz is downstream from a CBM discharge location. Because of additional discharge flow, the

vegetation on the banks of the creek has washed away, and his cottonwoods have died. Mr. Swartz believes that the state is to fault because no baseline data was gathered before CBM production was brought online. Ed also expressed additional concern for the soils on his property and believes that increased reservoir sizes upstream have deprived him of water rights the ranch has held since 1901. Additionally, Mr. Swartz expressed frustration with a rule from the State Engineer's Office that only allowed him access to his water from April 1-August 30.

L.J. Turner; Rancher; Southern Campbell County
Mr. Turner owns 15,000 acres and 1,500 acres of mineral rights. Since CBM discharge has started, L.J. has observed the loss of his adjacent springs and lower levels in domestic water waters. Mr. Turner believes that landowners downstream should have the right to deny water and that the state has a right to make a policy to preserve water resources and manage the effects of discharge downstream.

Caroline Hamilton; Rancher; Northern Sheridan County
Mrs. Hamilton is pleased with the discharge on her property which is used for irrigation purposes. Her and her husband have a positive relationship with the operators and all of the irrigation equipment is maintained by the contractors. Mrs. Hamilton believes that communication between industry and landowners is essential.

Don Rice; Rancher; Central Campbell County; Deadhorse Creek Area
Mr. Rice expressed that he has benefited from CBM discharge water. On his property, water is used to irrigate trees, water yards and domestic applications. Mr. Rice is currently working with the operator to pipe water to his house from three miles away for additional use, but currently he is awaiting the approval of adequate discharge permit.

The next meeting will be Thursday August 3, 2006 in Rawlins, 8:00 AM

The meeting was adjourned at 6:10 PM by Chairman Childers.